Claims

What is claimed:

1. A photocurable composition comprising following components:

(a) an epoxy component containing one or more epoxy compound(s);

with from 0 to less than 30% preferably to less than 28% more preferably to less than 20% by weight of the epoxy component being of glycidyl type,

(b) a (meth)acrylate component containing one or more multifunctional (meth)acrylates which:

(i) contain no hydroxyl groups; or

(ii) contain hydroxyl groups, but have a hydroxyl equivalent weight of 500 grams or less, preferably a hydroxyl equivalent weight of about 300 grams or less;

and preferably the (meth)acrylate component forms less than 20% by weight of the total composition,

(c) a component containing two or more hydroxyl groups, being preferably not a polyester compound, being preferably not an acrylated polyol, and preferably is a polyether polyol compound

(d) a cationic photoinitiator; and

(e) a free radical photoinitiator.

2. The photocurable composition of claim 1, wherein the one or more multifunctional (meth)acrylates comprise a pentaerythritol (meth)acrylate, comprising preferably pentaerythritol triacrylate and/or pentaerythritol tetraacrylate, more pentaerythritol triacrylate.

3. The photocurable composition according to any preceding claim, wherein the one or more multifunctional (meth)acrylates comprise a dipentaerythritol (meth)acrylate, preferably dipentaerythritol hexaacrylate.

4. The photocurable composition of any preceding claim, wherein the one or more multifunctional (meth)acrylates comprise an alkoxylated acrylate, preferably a trimethylolpropane ethoxylated triacrylate.

5. A photocurable composition comprising following components:

(a) a cationically curable component preferably formed from one or more epoxy compound(s)

(b) a (meth) acrylate component containing, preferably, formed from, dipentaerythritol hexaacrylate,

(c) a polyol component comprising a polyol compound containing two or more hydroxyl groups, preferably polyether polyol,

(d) a cationic photoinitiator; and

(e) a free radical photoinitiator.

6. A photocurable composition comprising following components:

(a) a cationically curable component preferably formed from one or more epoxy compound(s)

(b) a (meth)acrylate component containing alkoxylated acrylate, preferably free of hydroxyl groups, more preferably a trimethylolpropane ethoxylated triacrylate,

the (meth)acrylate component forming preferably less than 20% by weight of the total composition,

(c) a polyol component comprising a polyol compound containing two or more hydroxyl groups, preferably polyether polyol,

(d) a cationic photoinitiator; and

(e) a free radical photoinitiator.

7. The photocurable composition of any preceding claim wherein component (c) has a molecular weight of 1500 or less, preferably of about 260 or less.

8. The photocurable composition of any preceding claim, wherein the composition comprises about 3 to about 10 percent by weight of component (b).

9. The composition of any preceding claim, wherein the composition does not comprise multifunctional (meth)acrylates other than those defined by component (b)

10. The photocurable composition of any preceding claim, wherein said composition after cure has a yellow index/inch value of less than 90, preferably less than 80.

11. A process for producing a three dimensional article in sequential cross-sectional layers in accordance with a model of the article, the process comprising the steps of:

(1) forming a first layer of the photocurable composition of claim 1, 5 or 6;

(2) exposing said first layer to actinic radiation in a pattern corresponding to a respective cross-sectional layer of the model sufficient to harden the first layer in the imaged area;

(3) forming a second layer of said composition above the hardened first layer;

(4) exposing said second layer to actinic radiation in a pattern corresponding to a respective cross-sectional layer of the model sufficient to harden the second layer in the imaged area; and

(5) repeating steps (3)-(4) to form successive layers as desired to form said three dimensional article.

12. A process for forming a three-dimensional article in sequential cross-sectional layers in accordance with a model of the article, the process comprising the steps of: depositing droplets of the photocurable composition of claim 1, 5 or 6 onto a substrate in a pattern corresponding to a cross-sectional layer of the model so that adjacent droplets merge together; repeating these steps to form successive layers; and applying actinic radiation to cure the photocurable composition, pixel-by-pixel, line-by-line, layer-by-layer, after several layers have been formed and/or after all desired layers have been formed.

13. A three-dimensional article produced by the process of claim 11 or claim 12.